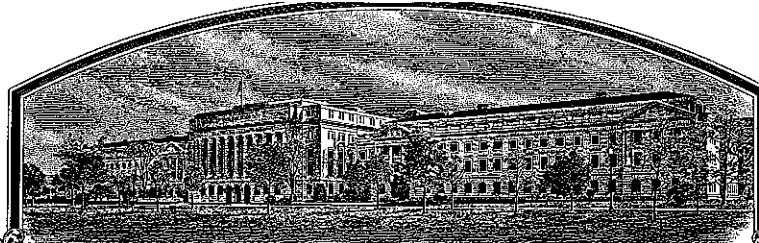


No.

200400061



# THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

## Minnesota Agricultural Experiment Station

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS, OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. IN THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS SPECIFIED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT, COMMON

'Oklee'



In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this twenty-sixth day of July, in the year two thousand and five.

Attest:

*Commissioner*  
Plant Variety Protection Office  
Agricultural Marketing Service

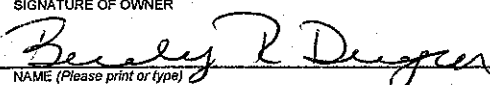
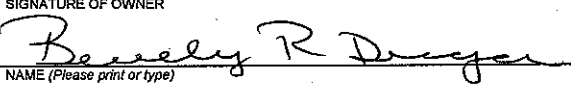
*Secretary of Agriculture*

U.S. DEPARTMENT OF AGRICULTURE  
AGRICULTURAL MARKETING SERVICE  
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE  
(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF OWNER  Minnesota Agricultural Experiment Station		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME  MN95002-A		3. VARIETY NAME  Oklee	
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)  277 Coffey Hall 1420 Eckles Ave. University of Minnesota St. Paul, MN 55108		5. TELEPHONE (include area code)  (612) 624-2299		FOR OFFICIAL USE ONLY VPPO NUMBER <b>20 0400061</b> FILING DATE Dec. 22, 2003	
		6. FAX (include area code)  (612) 625-1260			
7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.)  University		8. IF INCORPORATED, GIVE STATE OF INCORPORATION		9. DATE OF INCORPORATION	
10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. (First person listed will receive all papers)  James A. Anderson Dept. of Agronomy & Plant Genetics 411 Borlaug Hall 1991 Buford Circle University of Minnesota St. Paul, MN 55108				FILING AND EXAMINATION FEES: \$ 3652.00 DATE 12-22-2003 CERTIFICATION FEE: \$ 432.00 DATE 2/03/2005	
11. TELEPHONE (include area code)  (612) 625-9763		12. FAX (include area code)  (612) 625-1268		13. E-MAIL  ander319@umn.edu	
14. CROP KIND (Common Name)  Wheat		16. FAMILY NAME (Botanical)  Gramineae		18. DOES THE VARIETY CONTAIN ANY TRANSGENES? (OPTIONAL)  <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO  IF SO, PLEASE GIVE THE ASSIGNED USDA-APHIS REFERENCE NUMBER FOR THE APPLICATION TO DEREGULATE THE GENETICALLY MODIFIED PLANT FOR COMMERCIALIZATION.	
15. GENUS AND SPECIES NAME OF CROP  Triticum aestivum		17. IS THE VARIETY A FIRST GENERATION HYBRID?  <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			
19. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse)				20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act)  <input checked="" type="checkbox"/> YES (If "yes", answer items 21 and 22 below) <input type="checkbox"/> NO (If "no", go to item 23)	
a. <input checked="" type="checkbox"/> Exhibit A. Origin and Breeding History of the Variety b. <input checked="" type="checkbox"/> Exhibit B. Statement of Distinctness c. <input checked="" type="checkbox"/> Exhibit C. Objective Description of Variety d. <input checked="" type="checkbox"/> Exhibit D. Additional Description of the Variety (Optional) e. <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Owner's Ownership f. <input checked="" type="checkbox"/> Voucher Sample (2,500 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository) g. <input checked="" type="checkbox"/> Filing and Examination Fee (\$3,652), made payable to "Treasurer of the United States" (Mail to the Plant Variety Protection Office)				21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES?  <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO  IF YES, WHICH CLASSES? <input checked="" type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED	
				22. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?  <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO  IF YES, SPECIFY THE NUMBER 1,2,3, etc. FOR EACH CLASS.  <input checked="" type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED (If additional explanation is necessary, please use the space indicated on the reverse.)	
23. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES?  <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO  IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. (Please use space indicated on reverse.)				24. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT (PLANT BREEDER'S RIGHT OR PATENT)?  <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO  IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. (Please use space indicated on reverse.)	
25. The owners declare that a viable sample of basic seed of the variety has been furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate.  The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.  Owner(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.					
SIGNATURE OF OWNER   NAME (Please print or type)  Beverly R. Durgan			SIGNATURE OF OWNER   NAME (Please print or type)  Beverly R. Durgan		
CAPACITY OR TITLE  Associate Dean		DATE  12/18/2003		CAPACITY OR TITLE  Associate Dean	
		DATE  12/18/2003			

(See reverse for instructions and information collection burden statement)

**GENERAL:** To be effectively filed with the Plant Variety Protection Office (PVPO), **ALL** of the following items must be **received** in the PVPO: (1) Completed application form signed by the owner; (2) completed exhibits A, B, C, E; (3) for a seed reproduced variety at least 2,500 viable untreated seeds, for a hybrid variety at least 2,500 untreated seeds of each line necessary to **reproduce** the variety, or for tuber reproduced varieties verification that a viable (in the sense that it will reproduce an entire plant) tissue culture will be deposited and maintained in an approved public repository; (4) check drawn on a U.S. bank for \$3,652 (\$432 filing fee and \$3,220 examination fee), payable to "Treasurer of the United States" (See Section 97.6 of the Regulations and Rules of Practice.) Partial applications will be held in the PVPO for not more than 90 days, then returned to the applicant as unfilled. Mail application and other requirements to Plant Variety Protection Office, AMS, USDA, Room 401, NAL Building, 10301 Baltimore Avenue, Beltsville, MD 20705-2351. Retain one copy for your files. All items on the face of the application are self explanatory unless noted below. Corrections on the application form and exhibits must be initialed and dated. **DO NOT** use masking materials to make corrections. If a certificate is allowed, you will be requested to send a check payable to "Treasurer of the United States" in the amount of \$432 for issuance of the certificate. Certificates will be issued to owner, not licensee or agent.

**Plant Variety Protection Office**

**Telephone: (301) 504-5518**

**FAX: (301) 504-5291**

**Homepage:** <http://www.ams.usda.gov/science/pvpo/pvp.htm>

To avoid conflict with other variety names in use, the applicant must check the appropriate recognized authority and provide evidence that name has been cleared by the appropriate recognized authority before the Certificate of Protection is issued. For example, for agricultural and vegetable crops, contact: Seed Branch, AMS, USDA, 10301 Baltimore Avenue, Suite 401 NAL Building, Beltsville, MD 20705. Telephone: (301) 504-5682 <http://www.ams.usda.gov/lsg/seed.htm>.

## ITEM

- 19a. Give: (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method; (2) the details of subsequent stages of selection and multiplication; (3) evidence of uniformity and stability; and (4) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified
- 19b. Give a summary of the variety's distinctness. Clearly state how this application variety may be distinguished from all other varieties in the same crop. If the new variety is most similar to one variety or a group of related varieties:
- (1) identify these varieties and state all differences objectively;
  - (2) attach statistical data for characters expressed numerically and demonstrate that these are clear differences; and
  - (3) submit, if helpful, seed and plant specimens or photographs (prints) of seed and plant comparisons which clearly indicate distinctness.
- 19c. Exhibit C forms are available from the PVPO Office for most crops; specify crop kind. Fill in Exhibit C (Objective Description of Variety) form as completely as possible to describe your variety.
- 19d. Optional additional characteristics and/or photographs. Describe any additional characteristics that cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the characteristics that are difficult to describe, such as plant habit, plant color, disease resistance, etc.
- 19e. Section 52(5) of the Act requires applicants to furnish a statement of the basis of the applicant's ownership. An Exhibit E form is available from the PVPO.
20. If "Yes" is specified (*seed of this variety be sold by variety name only, as a class of certified seed*), the applicant **MAY NOT** reverse this affirmative decision after the variety has been sold and so labeled, the decision published, or the certificate issued. However, if "No" has been specified, the applicant may change the choice. (See Regulations and Rules of Practice, Section 97.103).
23. See Sections 41, 42, and 43 of the Act and Section 97.5 of the regulations for eligibility requirements.
24. See Section 55 of the Act for instructions on claiming the benefit of an earlier filing date.

## 22. CONTINUED FROM FRONT (Please provide a statement as to the limitation and sequence of generations that may be certified.)

Two generations of Certified Seed production are allowed under emergency situations with the consent of the originating breeder or institution.

## 23. CONTINUED FROM FRONT (Please provide the date of first sale, disposition, transfer, or use for each country and the circumstances, if the variety (including any harvested material) or a hybrid produced from this variety has been sold, disposed of, transferred, or used in the U.S. or other countries.)

First date of sale was March 17, 2003 in U.S. for certified seed production.

## 24. CONTINUED FROM FRONT (Please give the country, date of filing or issuance, and assigned reference number, if the variety or any component of the variety is protected by intellectual property right (Plant Breeder's Right or Patent).)

**NOTES:** It is the responsibility of the applicant/owner to keep the PVPO informed of any changes of address or change of ownership or assignment or owner's representative during the life of the application/certificate. The fees for filing a change of address; owner's representative; ownership or assignment; or any modification of owner's name is specified in Section 97.175 of the regulations. (See Section 101 of the Act, and Sections 97.130, 97.131, 97.175(h) of the Regulations and Rules of Practice.)

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 1.4 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, sexual orientation, marital or family status, political beliefs, parental status, or protected genetic information. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call 202-720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

**EXHIBIT A – ORIGIN AND BREEDING HISTORY****'OKLEE'*****Selection Criteria:***

Pedigree: Pioneer 2375/SBF0670

Cross and F1 generation handled by personnel with the former Hard Red Spring Wheat Breeding program Pioneer Hi-Bred Company. This was part of the material gifted to the University of Minnesota/USDA-ARS breeding program.

1993: F2 space-plant population population; University of Minnesota research land; segregating for maturity, plant height, and disease resistance, leaf and stem rust resistant plants selected; F3 single seed descent generation advance, University of Minnesota greenhouse. No selection applied.

1994: F4 head row (F3-derived); University of Minnesota research land; selected based on appropriate plant height, maturity, and leaf and stem rust resistance.

1995: F5 seed increase (increase of seed from a single spike from the F4 row); Arizona winter; no segregation observed within the single row.

1996: F6 Preliminary Yield Trial (tested as MN95002); University of Minnesota research land; selected based on appropriate plant height, maturity, field resistance to leaf and stem rust, grain protein content, test weight, grain yield, milling and baking quality; no segregation noted.

1997: F7 Advanced Yield Trial, University of Minnesota research land; selected based on appropriate plant height, maturity, field resistance to leaf and stem rust, Fusarium head blight resistance, grain protein content, test weight, grain yield, milling and baking quality; no segregation noted.

1998: Statewide Variety Trial (7 locations), University of Minnesota research land; Uniform Regional Performance Nursery; selected based on appropriate plant height, maturity, field resistance to leaf and stem rust, Fusarium head blight resistance, grain protein content, test weight, grain yield, milling and baking quality; no segregation noted.

1999: Statewide Variety Trial (7 locations), University of Minnesota research land, Uniform Regional Performance Nursery; selected based on appropriate plant height, maturity, field resistance to leaf and stem rust, Fusarium head blight resistance, grain protein content, test weight, grain yield, milling and baking quality; Approximately 1% tall plants observed. 100 random heads selected for purification and grown in Arizona winter nursery, 80 rows were selected based on uniformity of height among and within rows.

2000: Statewide Variety Trial (7 locations), University of Minnesota research land, selected based on appropriate plant height, maturity, field resistance to leaf and stem rust, Fusarium head blight resistance, grain protein content, test weight, grain yield, milling and baking quality; the 80 head selection harvested from Arizona were evaluated for uniformity and reaction to leaf rust, stem rust, and Fusarium head blight; 19 of the 80 selections were discarded due to later heading and/or shorter plant height. The remaining 61 selections were harvested and equal amounts of seed of each were bulked together and designated as MN95002-A

2001: Statewide Variety Trial (7 locations) including both MN95002 and MN95002-A, University of Minnesota research land; selected based on appropriate plant height, maturity, field resistance to leaf and stem rust, Fusarium head blight resistance, grain protein content, test weight, grain yield, milling and baking quality; 1,000 kg of breeder seed produced by Minnesota Crop Improvement Association.

2002: Statewide Variety Trial (7 locations), University of Minnesota research land; selected based on appropriate plant height, maturity, field resistance to leaf and stem rust, Fusarium head blight resistance, grain protein content, test weight, grain yield, milling and baking quality; approximately 100,000 kg of foundation seed was produced by Minnesota Crop Improvement Association via a winter nursery in California and 4 Minnesota locations.

2003: MN95002-A released as 'Oklee'.

***Evidence of Uniformity and Stability:***

Oklee has been stable since purification and formation of MN95002-A in 2000. Approximately 3 in 10,000 plants are more than 10 cm taller. The frequency of tall plants varies somewhat with the environmental conditions, but has not exceeded 5 in 10,000. *these tall plants are variants.*

*mjh  
10/12/04*

**EXHIBIT B. - NOVELTY STATEMENT**

Oklee is most similar to 2375. Oklee differs from 2375 in having the 17+18 high molecular weight subunit at the *Glu*-1B locus. The high molecular weight glutenin alleles are summarized in Table 1 below and shown in attached Figure 1.

Table 1. High molecular weight glutenin allele composition of 'Oklee' and '2375'. Allele nomenclature is according to Payne et al. 1980. Theor. Appl. Genet. 58:113-120.

Variety	Chromosome		
	1A	1B	1D
Oklee	2*	17+18	5+10
2375	2*	7+8	5+10

## Exhibit B. – Novelty Statement, cont.

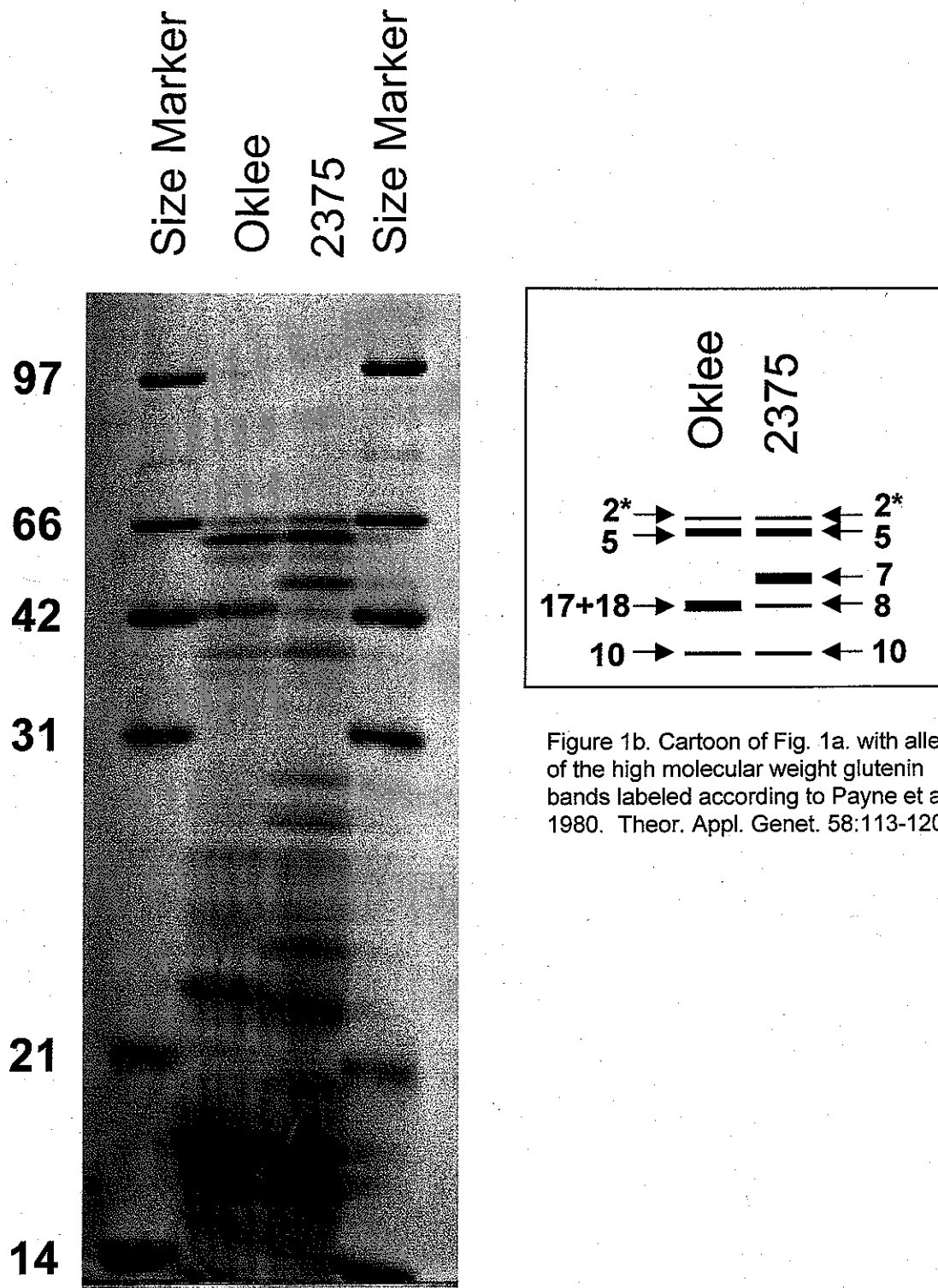


Figure 1a. SDS-PAGE gel of high molecular weight glutenins of 'Oklee' and '2375'. Lanes are flanked by size markers. Molecular weights (x 10<sup>3</sup>) of marker bands are given on the left side.

## Exhibit B. – Novelty Statement. Addendum

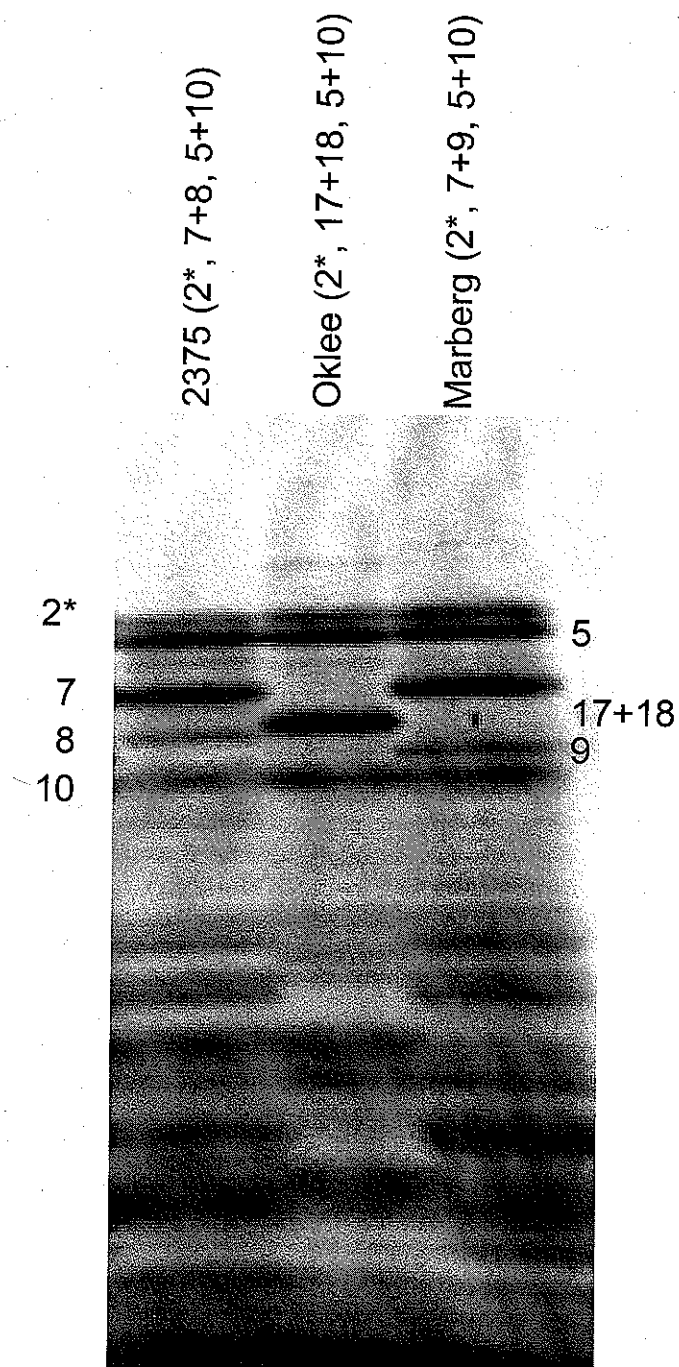


Fig. 1c. SDS-PAGE gel of high molecular weight glutenins of '2375', 'Oklee' and 'Marberg'. Band designations according to Theor. Appl. Genet. 58:113-120 are given next to each band.



U.S. DEPARTMENT OF AGRICULTURE  
AGRICULTURAL MARKETING SERVICE  
SCIENCE DIVISION  
BELTSVILLE, MARYLAND 20705

EXHIBIT C  
(Wheat)

OBJECTIVE DESCRIPTION OF VARIETY  
WHEAT (*Triticum* spp.)

NAME OF APPLICANT(S) Minnesota Agricultural Experiment Station	FOR OFFICIAL USE ONLY
ADDRESS (Street and No. or R.F.D. No., City, State, and Zip Code) 277 Coffey Hall 1420 Eckles Ave. University of Minnesota St. Paul, MN 55108	PVPO NUMBER 20 0400061 VARIETY NAME  TEMPORARY OR EXPERIMENTAL DESIGNATION

PLEASE READ ALL INSTRUCTIONS CAREFULLY: Place the appropriate number that describes the varietal character of this variety in the boxes below. Place a zero in the first box (e.g.    or   ) when number is either 99 or less or 9 or less respectively. Data for quantitative plant characters should be based on a minimum of 100 plants. Comparative data should be determined from varieties entered in the same trial. Royal Horticultural Society or any recognized color standard may be used to determine plant colors; designate system used: \_\_\_\_\_

Please answer all questions for your variety; lack of response may delay progress of your application.

1. KIND:  
 1=Common 2=Durum 3=Club 4=Other (SPECIFY) \_\_\_\_\_

2. VERNALIZATION:  
 1=Spring 2=Winter 3=Other (SPECIFY) \_\_\_\_\_

3. COLEOPTILE ANTHOCYANIN:  
 1=Absent 2=Present

4. JUVENILE PLANT GROWTH:  
 1=Prostrate 2=Semi-erect 3=Erect

5. PLANT COLOR (boot stage):  
 1 = Yellow-Green 2 = Green 3 = Blue-Green

6. FLAG LEAF (boot stage):  
 1 = Erect 2 = Recurved  1 = Not Twisted 2 = Twisted

7. EAR EMERGENCE:  
  1 Number of Days Earlier Than 2375 \*  
  0 Number of Days Later Than Forge \*

8. ANTHOR COLOR:  
 1 = YELLOW 2 = PURPLE

9. PLANT HEIGHT (from soil to top of head, excluding awns):  
  0 cm Taller Than Oxen \*  
  3 cm Shorter Than 2375 \*  
8

20 0400061

## 10. STEM:

## A. ANTHOCYANIN

☒ 1 = Absent      2 = Present

## B. WAXY BLOOM

☒ 2 = Absent      2 = Present

## C. HAIRINESS (last internode of rachis)

☒ 1 = Absent      2 = Present

## D. INTERNODE (SPECIFY NUMBER) \_\_\_\_\_

☒ 1 = Hollow      2 = Semi-solid      3 = Solid

## E. PEDUNCLE

☒ 2 = Absent      2 = Present

☒ 3 cm Length

## 11. HEAD (at Maturity):

## A. DENSITY

☒ 2 = Lax      2 = Middense      3 = Dense

## B. SHAPE

☒ 1 = Tapering      2 = Strap      3 = Clavate      4 = Other (SPECIFY) \_\_\_\_\_

## C. CURVATURE

☒ 2 = Erect      2 = Inclined      3 = Recurved

## D. AWNEDNESS

☒ 4 = Awnless      2 = Apically Awnletted      3 = Awnletted      4 = Awned

## 12. GLUMES (at Maturity):

## A. COLOR

☒ 1 = White      2 = Tan      3 = Other (SPECIFY) \_\_\_\_\_

## B. SHOULDER

☒ 6 = Wanting      2 = Oblique      3 = Rounded      4 = Square      5 = Elevated      6 = Apiculate

## C. BEAK

☒ 3 = Obtuse      2 = Acute      3 = Acuminate

## D. LENGTH

☒ 1 = Short (ca. 7mm)      2 = Medium (ca. 8mm)      3 = Long (ca. 9mm)

## E. WIDTH

☒ 1 = Narrow (ca. 3mm)      2 = Medium (ca. 3.5mm)      3 = Wide (ca. 4mm)

## 13. SEED:

## A. SHAPE

☒ 1 = Ovate      2 = Oval      3 = Elliptical

## B. CHEEK

☒ 2 = Rounded      2 = Angular

## C. BRUSH

☒ 2 = Short      2 = Medium      3 = Long

☒ 1 = Not Collared      2 = Collared

## D. CREASE

☒ 1 = Width 60% or less of Kernel  
 2 = Width 80% or less of Kernel  
 3 = Width Nearly as Wide as Kernel

☒ 2 = Depth 20% or less of Kernel  
 2 = Depth 35% or less of Kernel  
 3 = Depth 50% or less of Kernel

## 13. SEED: (continued)

## E. COLOR

☒ 3

1 = White

2 = Amber

3 = Red

4 = Other (SPECIFY) \_\_\_\_\_

## F. TEXTURE

☒ 1

1 = Hard

2 = Soft

## G. PHENOL REACTION (see instructions):

☐

1 = Ivory

2 = Fawn

3 = Light Brown

4 = Dark Brown

5 = Black

14. DISEASE: (0=Not Tested; 1=Susceptible; 2=Resistant; 3=Intermediate; 4=Tolerant)  
PLEASE INDICATE THE SPECIFIC RACE OR STRAIN TESTEDStem Rust (*Puccinia graminis* f. sp. *tritici*)☒ 2

Mixture of races

Stripe Rust (*Puccinia striiformis*)☐ 0Tan Spot (*Pyrenophora tritici-repentis*)☒ 3

Pti 2

Halo Spot (*Selenophoma donacis*)☐ 0

Septoria nodorum (Glume Blotch)

☒ 3

mixture of Isolates

Septoria avenae (Speckled Leaf Disease)

☐ 0

Septoria tritici (Speckled Leaf Blotch)

☒ 3

mixture of isolates

Scab (*Fusarium* spp.)☒ 3

Mixture of races isolates

"Black Point" (Kernel Smudge)

☒ 2

Natural Infection

Barley Yellow Dwarf Virus (BYDV)

☐ 0

Soilborne Mosaic Virus (SBMV)

☐ 0

Wheat Yellow (Spindle Streak) Mosaic Virus

☐ 0

Wheat Streak Mosaic Virus (WSMV)

☐ 0

Other (SPECIFY) \_\_\_\_\_

☐

Other (SPECIFY) \_\_\_\_\_

☐

Other (SPECIFY) \_\_\_\_\_

☐Leaf Rust (*Puccinia recondita* f. sp. *tritici*)☒ 3

Mixture of races

Loose Smut (*Ustilago tritici*)☐ 0Flag Smut (*Urocystis agropyri*)☐ 0Common Bunt (*Tilletia tritici* or *T. laevis*)☐ 0Dwarf Bunt (*Tilletia controversa*)☐ 0Karnal Bunt (*Tilletia indica*)☐ 0Powdery Mildew (*Erysiphe graminis* f. sp. *tritici*)☐ 0

"Snow Molds"

☐ 0Common Root Rot (*Fusarium*, *Cochliobolus* and *Bipolaris* spp.)☐ 0Rhizoctonia Root Rot (*Rhizoctonia solani*)☐ 0Black Chaff (*Xanthomonas campestris* pv. *translucens*)☒ 2

Natural Infection

Bacterial Leaf Blight (*Pseudomonas syringae* pv. *syringae*)☒ 2

Natural Infection

Other (SPECIFY) \_\_\_\_\_

☐

Other (SPECIFY) \_\_\_\_\_

☐

Other (SPECIFY) \_\_\_\_\_

☐

Other (SPECIFY) \_\_\_\_\_

☐

15. INSECT: (0=Not Tested; 1=Susceptible; 2=Resistant; 3=Intermediate; 4=Tolerant)

PLEASE SPECIFY BIOTYPE (where needed)

Hessian Fly (*Mayetiola destructor*)

☐ 0

Other (SPECIFY) \_\_\_\_\_

☐

Stem Sawfly (*Cephus spp.*)

☐ 0

Other (SPECIFY) \_\_\_\_\_

☐

Cereal Leaf Beetle (*Oulema melanopa*)

☐ 0

Other (SPECIFY) \_\_\_\_\_

☐

Russian Aphid (*Diuraphis noxia*)

☐ 0

Other (SPECIFY) \_\_\_\_\_

☐

Greenbug (*Schizaphis graminum*)

☐ 0

Other (SPECIFY) \_\_\_\_\_

☐

Aphids

☐ 0

Other (SPECIFY) \_\_\_\_\_

☐

16. ADDITIONAL INFORMATION ON ANY ITEM ABOVE, OR GENERAL COMMENTS:

**EXHIBIT D. – ADDITIONAL DESCRIPTION OF VARIETY****Table 1. Agronomic Characteristics of Oklee  
and selected checks (2001-2002), 13 environments.**

<b>Variety</b>	<b>Origin</b>	<b>Days to Heading</b>	<b>Height cm</b>	<b>Straw strength</b>	<b>Test Weight Lb/Bu</b>	<b>Protein %</b>
2375	PI 1988	60.4	78	medium	59.9	14.7
ALSEN	ND 2000	60.8	78	strong	60.4	15.6
FORGE	SD 1997	59.1	80	strong	60.3	14.4
HJ98	MN 1998	62.1	75	medium	58.2	14.5
INGOT	SD 1998	58.8	87	m. strong	61.3	14.9
IVAN	AP 1998	63.3	75	v. strong	59.2	14.0
KNUDSON	AP 2001	60.8	76	m. strong	59.9	14.6
<b>Oklee</b>	<b>MN</b>	<b>59.1</b>	<b>75</b>	<b>medium</b>	<b>60.9</b>	<b>15.1</b>
OXEN	SD 1996	59.7	75	m. strong	58.7	14.8
PARSHALL	ND 1999	60.6	85	strong	61.2	15.1
REEDER	ND 1999	60.5	79	strong	59.4	14.7
RUSS	SD 1995	60.8	80	m. strong	58.7	14.3
VERDE	MN 1995	63.1	76	m. strong	58.9	14.6
WALWORTH	SD 2001	59.3	79	medium	59.0	14.9
Mean		60.6	78.4		59.7	14.7

Table 1. Small plot quality comparisons of Oklee with selected checks, 1998-2000.<sup>1,2</sup>

VARIETY	1,000 Kernel wt. mg	Large kernels %	NIR Hardness	Wheat		Mixing -----		Baking Abs %	Loaf Volume cc
				Protein %	Abs %	Pattern 1-10	Time min.		
2375	33.6	69	75	14.4	56.3	2.8	2.6	59.4	196
HJ98	28.1	41	63	14.0	55.4	2.9	3.7	58.9	201
Ingot	31.1	66	75	15.3	56.6	3.0	3.0	59.1	203
Oklee	31.6	67	70	15.3	56.0	1.8	2.3	58.8	204
Oxen	29.5	62	80	14.8	57.1	3.3	3.4	59.9	203

1. Data are an average of 12 samples: a composite of three 1998 Northern locations; a composite of three 1998 Southern locations; a composite of three 1999 Southern locations; a composite of three 2000 Southern locations; and 1999 and 2000 samples from Stephen, Roseau, Crookston, and Morris. All data are from the USDA/ARS Grain Quality Lab in Fargo.
2. Higher numbers are desirable for all traits, except mixing time where a low to intermediate number is preferred, assuming good mixing tolerance.

Table 2. Small plot quality comparisons of Oklee with selected checks, 2002.<sup>1,2</sup>

Cultivar	1,000 Kernel wt. mg	Large kernels %	NIR Hardness	Wheat		Abs (%)	Mixing -----		Rating Scores <sup>3</sup>			Loaf Vol cc	
				Protein %	Protein		Pattern 1-10	Time (min)	DC	CC	CG		CT
2375	32.2	59.4	75.9	13.8	12.6	56.7	3.2	5.1	2.8	3.8	3.2	4.2	180
HJ98	28.7	36.4	59.7	13.7	12.4	56.8	4.0	8.6	2.8	4.6	3.2	4.4	199
Ingot	28.6	51.4	73.0	14.2	13.3	57.9	4.0	5.6	2.8	4.4	3.2	5.2	199
Oklee	31.8	56.2	69.5	14.3	13.8	57.9	2.6	3.9	2.8	3.6	3.6	4.8	199
Oxen	29.2	54.2	78.1	13.3	12.0	56.4	3.2	7.0	2.6	4.2	2.8	4.4	196

1. Data are an average of 5 samples from Crookston, Lamberton, Morris, Roseau, and St. Paul.
2. Higher numbers are desirable for all traits, except mixing time where a low to intermediate number is preferred,
3. DC=dough characteristics; CC=crumb color; CG=crumb grain; CT=crumb texture; higher numbers are better except for DC when 3 is best.

Table 3. Quality comparisons of 'Oklee' with 'Grandin' checks in the 1999 and 2000 Wheat Quality Council Trials.<sup>1</sup>

	Flour Extraction (%)		Test Weight lbs/bu	Wheat Protein %	Flour Protein %	Flour Ash %	Farinograph		Bake		Mix Tolerance	Loaf Volume	Crumb		Overall Rating
	0.46% ash flour	Straight grade flour					water abs	Abs	Mix Time	Tolerance			Color	Grain Texture	
<b>1999 Crookston</b>															
Grandin 1 (check)	53.0	74.5	57.7	12.8	11.9	0.49	58.4	3.4	4.4	4.4	4.0	4.0	3.9	4.3	4.1
Grandin 2 (check)	58.1	74.3	57.7	12.9	11.7	0.49	58.5	3.3	4.0	4.0	3.6	3.6	3.7	4.3	3.7
Oklee	69.2	73.4	57.6	13.0	12.1	0.44	58.1	3.1	3.5	3.5	3.6	3.6	3.9	3.5	3.4
<b>2000 Casselton</b>	0.40%														
Grandin 1 (check)	34	72	62.0	12.7	12.1	0.55	60.6	3.5	4.6	4.3	4.0	4.0	4.4	4.2	4.0
Grandin 2 (check)	43	73	62.4	14.4	13.6	0.56	62.8	4.4	3.9	4.0	4.6	4.6	4.0	3.8	4.0
Oklee	43	70	64.6	14.4	13.4	0.50	61.9	3.8	2.9	3.0	3.8	3.8	3.5	3.0	3.3
<b>2000 Crookston</b>	0.40%														
Grandin 1 (check)	28	74	62.3	15.5	14.6	0.60	64.6	4.7	3.7	3.7	4.4	4.4	4.3	4.0	3.9
Grandin 2 (check)	39	72	60.7	16.1	15.0	0.53	64.1	4.7	4.5	4.6	4.6	4.6	4.5	4.3	4.2
Oklee	49	72	60.7	15.7	14.8	0.50	64.6	4.2	3.0	2.5	3.8	3.8	3.5	2.7	3.2

<sup>1</sup> Higher numbers are desirable for all traits, except flour ash, and mixing time where a low to intermediate number is preferred, assuming good mixing tolerance. The samples were milled on the Miag Pilot Mill by the USDA-ARS Wheat Quality Laboratory in Fargo, ND. Mixing/baking parameters are averages of 11 cooperators that included State, Federal, and Private labs.

**EXHIBIT E - STATEMENT OF THE BASIS OF THE APPLICANT'S OWNERSHIP**

Dr. James A. Anderson, an employee of the University of Minnesota is the lead plant breeder who developed 'Oklee' the hard red spring wheat cultivar for which Plant Variety Protection is hereby sought. The employee by agreement and because of the condition of the use of facilities and funds of the University of Minnesota has assigned all ownership right to 'Oklee' hard red spring wheat to the University of Minnesota.